

Date: Thursday, 2/15/2007 8:01:23 AM  
 User: Jean-Luc Menard

## Process Sheet

PRELIMINARY ISSUE

Customer : CU-DAR001 Dart Helicopters Services Drawing Name : X-TUBE 412  
 Job Number : 30739  
 Estimate Number : 12727  
 P.O. Number :  
 This Issue : 2/15/2007 S.O. No. :  
 Prsht Rev. : NC  
 First Issue : 11 Type : LANDING GEAR  
 Previous Run :  
 Written By : 07-02-15  
 Checked & Approved By :  
 Comment : Est Rev:A New Issue 07-02-14 JLM

Part Number : D412664245  
 Drawing Number : D412-664-245 U/R  
 Project Number : N/A  
 Drawing Revision : U/R  
 Material :  
 Due Date : 2/22/2007 Qty: 3 Um: Each

## Additional Product

Job Number:



Seq. #: Machine Or Operation: Description:

1.0 D6009129 Crosstube Material



Comment: Qty.: 1.0000 Each(s)/Unit Total: 2.0000 Each(s)

Pick:

Qty Part number Description Batch

1 D6009-129 Crosstube 26548

Check OD = 3.500"; ID = 2.250"

BC/ MS 07/02/15 23

2.0 MORI SEIKI MORI SEIKI CNC LATHE LARGE



Comment: MORI SEIKI CNC LATHE LARGE

Turn as per Dwg D412-664-245

BC/ MS 07/02/15 23

3.0 QC2 INSPECT PARTS AS THEY COME OFF MACHINE



Comment: INSPECT PARTS AS THEY COME OFF MACHINE

BC/ MS 07/02/15 23

4.0 QC8 SECOND CHECK



Comment: SECOND CHECK

X 07/02/20 3

5.0 LANDING GEAR 1 LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Polish entire outside surface of crosstube

DP 7-2-20

2 files scrapped.

Date: Thursday, 2/15/2007 8:01:23 AM  
User: Jean-Luc Menard

## Process

Customer: CU-DAR001 Dart Helicopters Services

Dwg

TUBE 412

Job Number: 30739

Part

2664245

Job Number:



Seq. #:

Machine Or Operation:

Description :

6.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

BE 07/02/20

7.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat as per QSI 005 4.1

N/A 07/02/20

8.0

QC3/5

INSPECT WORK/WING WALK



Comment: Inspect work & Chemical conversion Coat

N/A 07/02/20

9.0

BENDING

BENDING MACHINE



Comment: BENDING MACHINE

Bend tube as per Dwg D412-664-243 using CNC bender program 412-af and Folio FT010

10.0

QC6

DIMENSIONAL CHECK



Comment: DIMENSIONAL CHECK

11.0

LANDING GEAR 1

LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Drill pilot holes in tube as per Dwg D412-664-245

2-Ream hole to finish size in tube as per Dwg D412-664-245

3-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D412-664-245

12.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat as per QSI 005 4.1

## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: X-TUBE 412

Job Number: 30739

Part Number: D412664245

Job Number:



Seq. #:	Machine Or Operation:	Description :
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13.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

14.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

15.0

D2732

Rubber Extrusion



Comment: Qty.: 0.4830 f(s)/Unit Total : 0.9660 f(s)  
Rubber Extrusion  
2 X 5.8" pcs  
Batch: \_\_\_\_\_

16.0

D28961

Support



Comment: Qty.: 1.0000 Each(s)/Unit Total : 2.0000 Each(s)  
Pick:  
Qty Part number Description Batch  
1 D2896-1 Support \_\_\_\_\_

17.0

D2856600

Abrasion Strip



Comment: Qty.: 0.9450 f(s)/Unit Total : 1.8900 f(s)  
Abrasion Strip  
2 X D2856-600-1009  
Batch: \_\_\_\_\_

18.0

MS2192028

Clamp(per MIL-DTL-8783C)



Comment: Qty.: 4.0000 Each(s)/Unit Total : 8.0000 Each(s)  
Pick:  
Qty Part number Description Batch  
4 MS21920-28 Clamp \_\_\_\_\_

19.0

MS2192032

clamp(per MIL-DTL-8783C)



Comment: Qty.: 2.0000 Each(s)/Unit Total : 4.0000 Each(s)  
clamp(per MIL-DTL-8783C)  
batch: \_\_\_\_\_

## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: X-TUBE 412

Job Number: 30739

Part Number: D412664245

Job Number:



Seq. #:

Machine Or Operation:

Description :

20.0

LANDING GEAR 1

LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1  
Assemble as per Dwg D412-664-245

Instal support with magnobond 6398 per dwg D412-664-245,  
cure for 12hrs before packaging.

Time & date of application: \_\_\_\_\_

Batch: \_\_\_\_\_

21.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

22.0

ENGINEERING 1

ENGINEERING RESOURCE #1



Comment: ENGINEERING Approval

Approval of project manager: \_\_\_\_\_

23.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

Job Completion



*W 07-01-25*

Date: Wednesday, 2/14/2007 3:12:13 PM  
User: Jean-Luc Menard

# **Process Sheet**

<b>Customer</b> :	CC-DAR01 Dart Aerospace Ltd.	<b>Drawing Name</b> :	INITIAL PROTOTYPE TEMPLATE
<b>Job Number</b> :	00085A		
<b>Estimate Number</b> :	10068		
<b>P.O. Number</b> :		<b>Part Number</b> :	INITIAL PROTOTYPE
<b>This Issue</b> :	2/14/2007	<b>Drawing Number</b> :	
<b>Prsht Rev.</b> :	NC	<b>Project Number</b> :	LG0006
<b>First Issue</b> :	11/9/2006	<b>Drawing Revision</b> :	
<b>Previous Run</b> :	00084A	<b>Material</b> :	
<b>Written By</b> :		<b>Due Date</b> :	10/10/2006
<b>Checked &amp; Approved By</b> :		<b>Qty:</b>	1 Um: Each
<b>Comment</b> :	Project #: _____ Description: _____		

## **Additional Product**

Job Number: 

<b>Seq. #:</b>	<b>Machine Or Operation:</b>	<b>Description :</b>
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1.0	MFG ENGINEERING	MFG ENGINEERING
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**Comment:** MFG ENGINEERING

Manufacture Prototype as per Dwg's Supplied By Engineering

Comments:

- extrusion D6009-129 BATCH B26548

2.0	MORI SEIKI	MORI SEIKI CNC LATHE LARGE
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**Comment:** MORI SEIKI CNC LATHE LARGE

**PRELIMINARY ISSUE**

DESIGN 90	DRAWN BY 90	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED	APPROVED	DRAWING NO. D412-664-245	REV. B SHEET 1 OF 3
DATE 07.02.14		TITLE CROSSTUBE ASS'Y (412 LOW-N AFT) NTS	
A	06.12.01	NEW ISSUE	
B	07.02.14	CHANGE TAPER NEAR CUFF	

**PARTS LIST:**

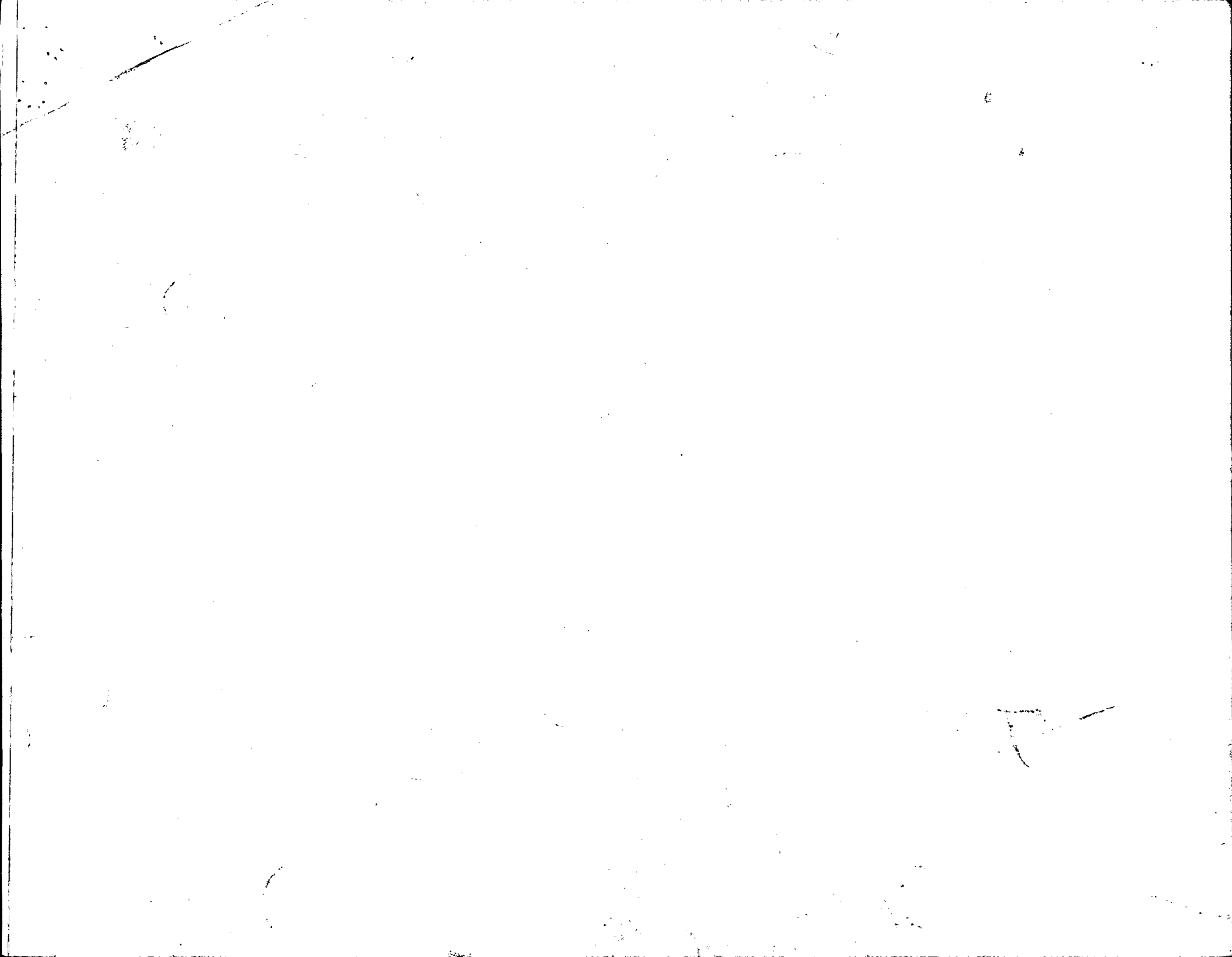
Qty	Part Number	Description
X	D412-664-245	CROSSTUBE ASSEMBLY (412 LOW-NARROW AFT)
1	D6009-129	CROSSTUBE
2	D2732-058	RUBBER CUSHION
1	D2896-1	SUPPORT
2	D2856-600-1009	ABRASION STRIP
4	MS21920-28	CLAMP
2	MS21920-32	CLAMP
2	D3189-1	CHAFING SHIELD
A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

**GENERAL NOTES:**

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 2) MATERIAL: MANUFACTURED FROM D6009-129  
FINISHED LENGTH =  $123.59 \pm 0.020$  (BEFORE BENDING/TRIMMING)
- 3) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART 005 4.2
- 4) PART IS SYMMETRIC ABOUT CENTERLINE.
- 5) RUN-OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 6) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 7) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 8) SCRIBE DART PART NUMBER AND BATCH NUMBER IN THIS AREA WITH VIBRATING STYLUS.
- 9) INSTALL D2856-600-1009 ABRASION STRIP WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF CROSSTUBE PER QSI 035.
- 10) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 11) APPLY A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2896-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR PACKAGING.
- 12) INSTALL MS21920-32 CLAMPS WITH D2732-058 RUBBER CUSHIONS TO SECURE D2896-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE CROSSTUBE SUPPORT.
- 13) TORQUE CLAMPS 80 TO 100 IN-LB.

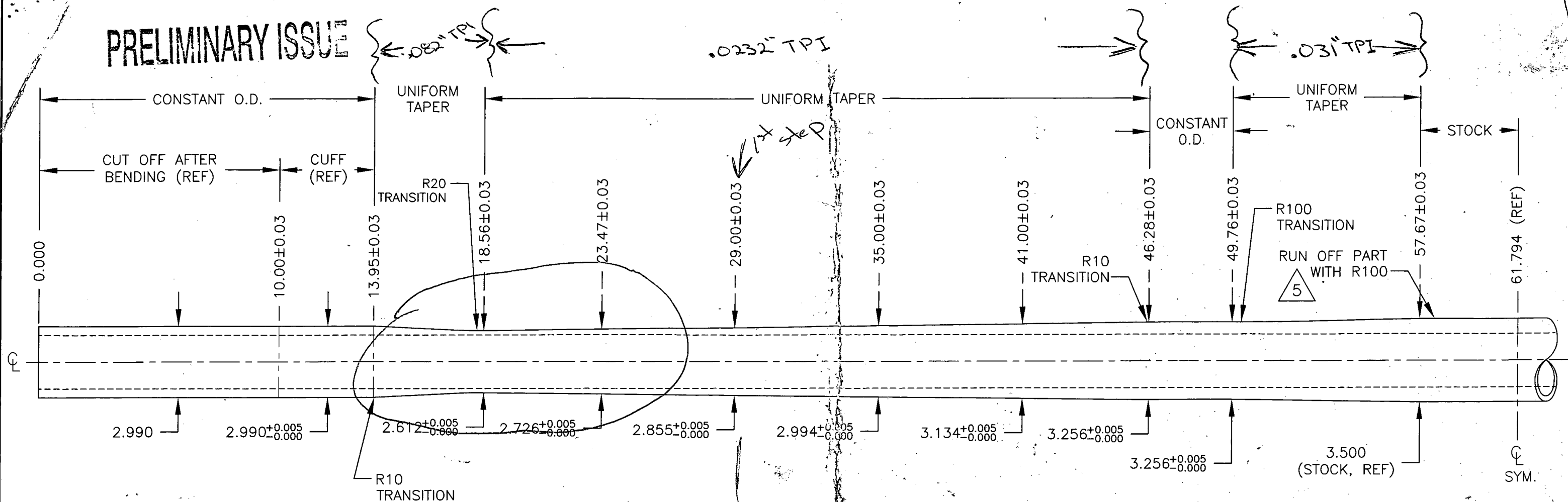
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PRELIMINARY ISSUE



D412-664-245 MACHINING DETAIL

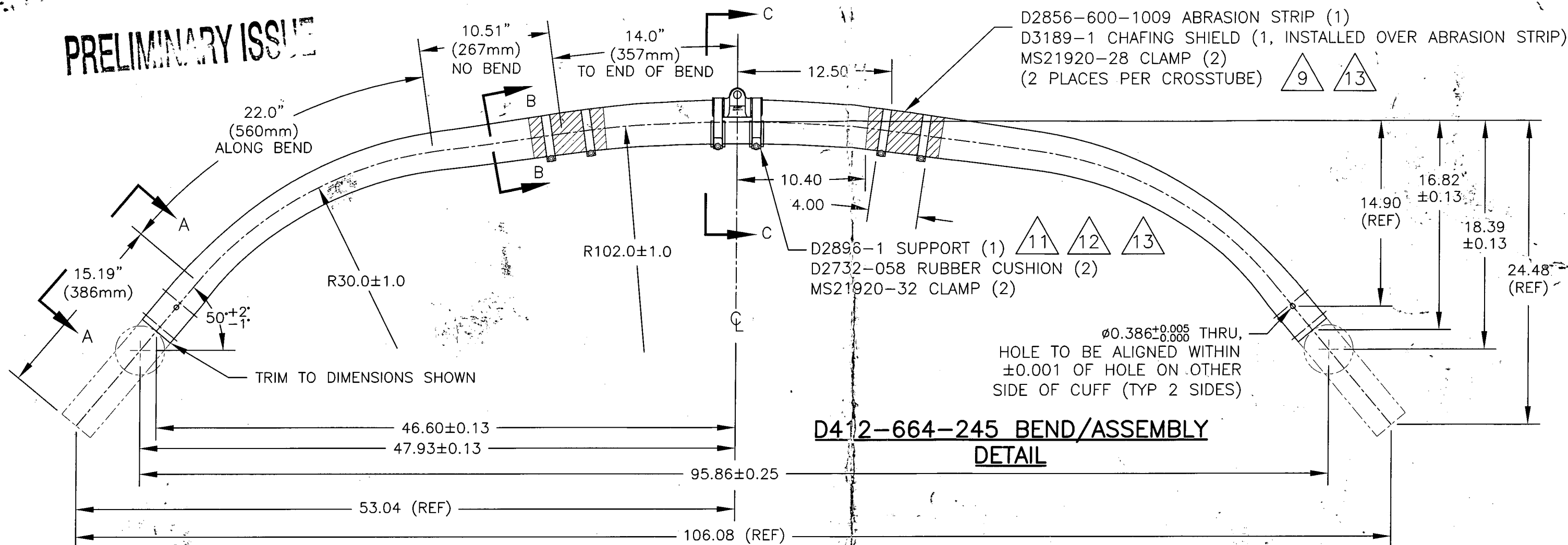
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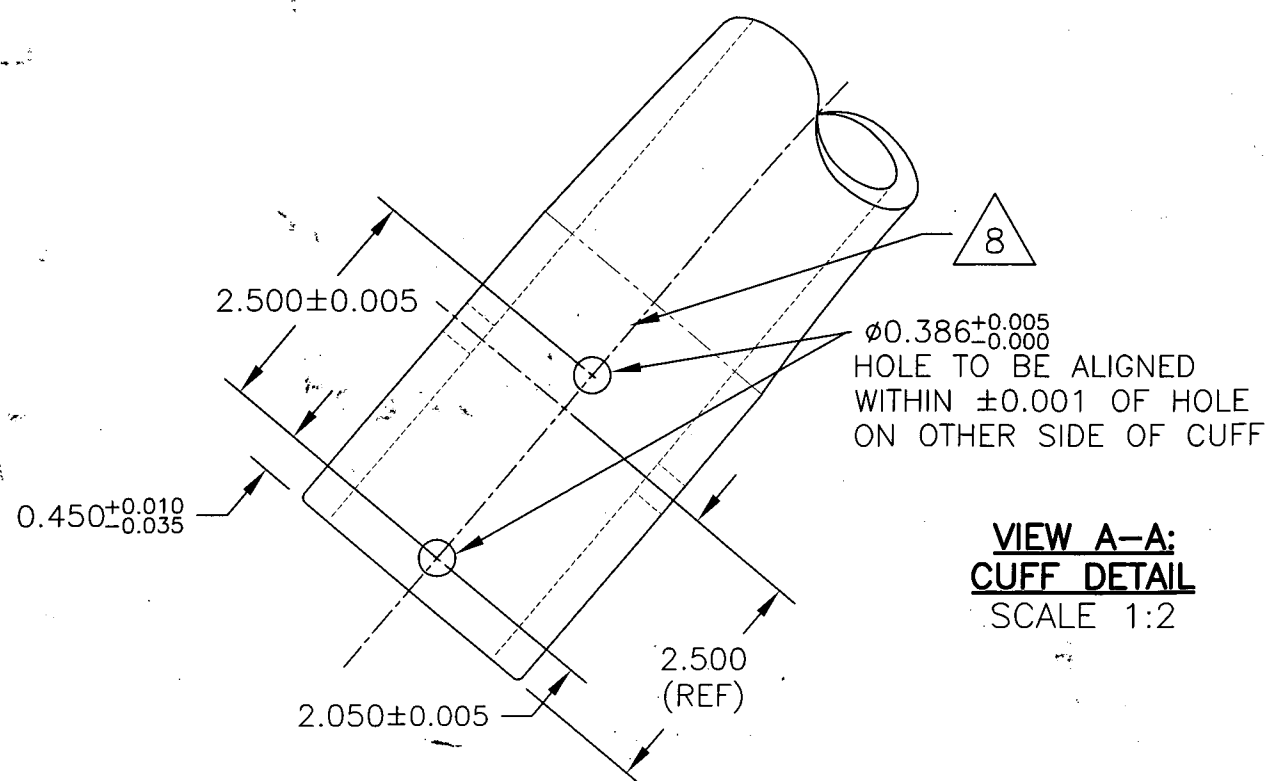
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	CHECKED	APPROVED	
	DATE	TITLE	
	07.02.14	CROSSTUBE (412 LOW-NARROW AFT)	
			REV. B
			SHEET 3 OF 3
			SCALE 1:4



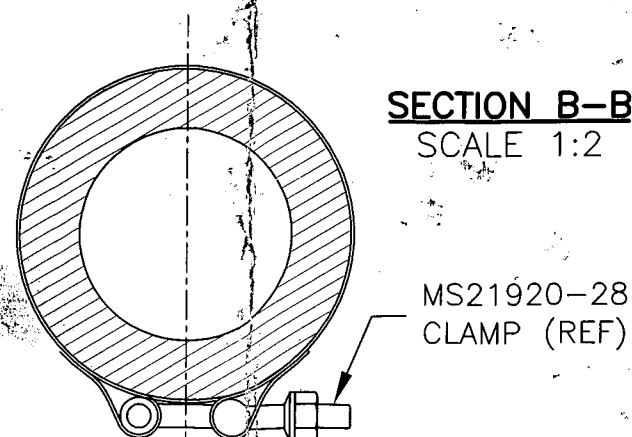
PRELIMINARY ISSUE



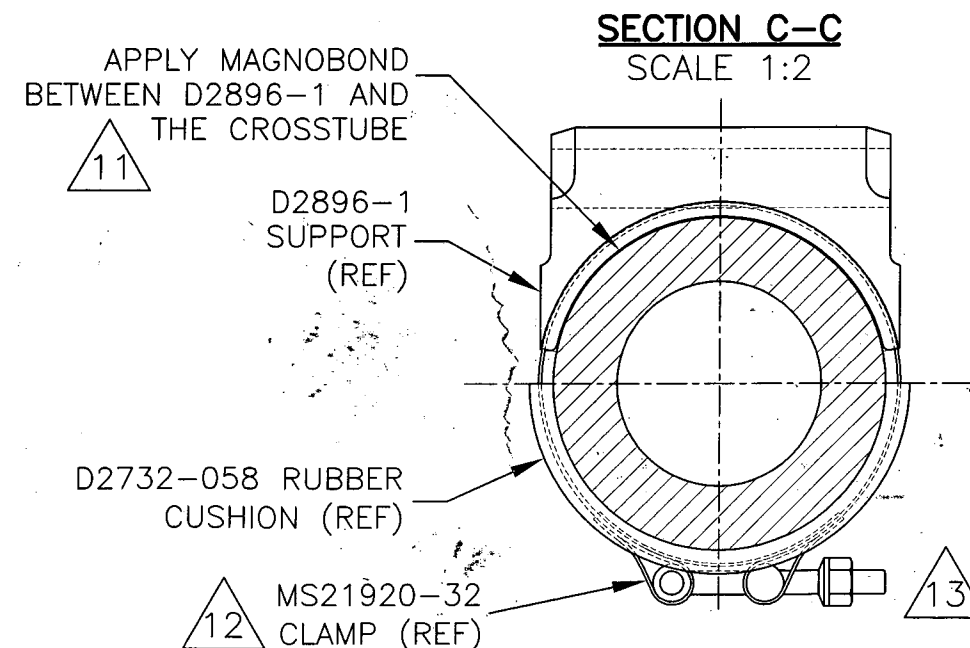
**D412-664-245 BEND/ASSEMBLY  
DETAIL**



**VIEW A-A:  
CUFF DETAIL  
SCALE 1:2**



**SECTION B-B  
SCALE 1:2**



**SECTION C-C  
SCALE 1:2**

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DATE 07.02.14		TITLE CROSSTUBE (412 LOW-NARROW AFT)		SCALE 1:8	



<b>DART AEROSPACE LTD</b>		<b>Work Order:</b> 30739
<b>Description:</b> Crosstube Assembly		<b>Part Number:</b> D412-664-245
<b>Inspection Dwg:</b> D412-664-245 Rev: B		<b>Page</b> 1 of 2

### FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article    ☒ Prototype

Inspection Sheet Drawing Dimension		Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	2.990	+0.005 -0.000	2.994	✓			
	2.612	"	2.617	✓			
	2.726	"	2.730	✓			
	2.855	"	2.860	✓			
	2.994	"	2.997	✓			
	3.134	"	3.138	✓			
	3.256	"	3.261	✓			
	3.256	"	3.261	✓			
	3.500	"	3.500	✓			
SIDE B	2.990	+0.005 -0.000	2.993	✓			
	2.612	"	2.616	✓			
	2.726	"	2.730	✓			
	2.855	"	2.859	✓			
	2.994	"	2.997	✓			
	3.134	"	3.137	✓			
	3.256	"	3.260	✓			
	3.256	"	3.260	✓			
	3.500	"	3.500	✓			

<b>Measured by:</b> MS RB
<b>Date:</b> 07/02/19

<b>Audited by:</b> <i>[Signature]</i>
<b>Date:</b> 07/02/20

<b>Prototype Appr</b>
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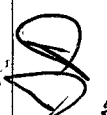
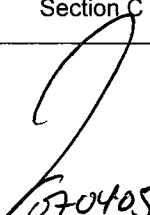
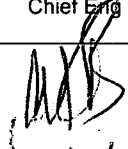
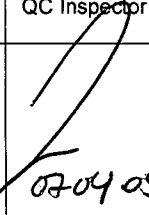
Rev	Date	Change	Rev
A		New Issue	KJ/J

[illegible]

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
07-4-05	9.0	2 tubes broke in the bender. 1 tube has bad, deep machining marks.	 07/04/05	destroy.	 7-4-05	 070405	 07/4/05	 070405

NOTE: Date & initial all entries